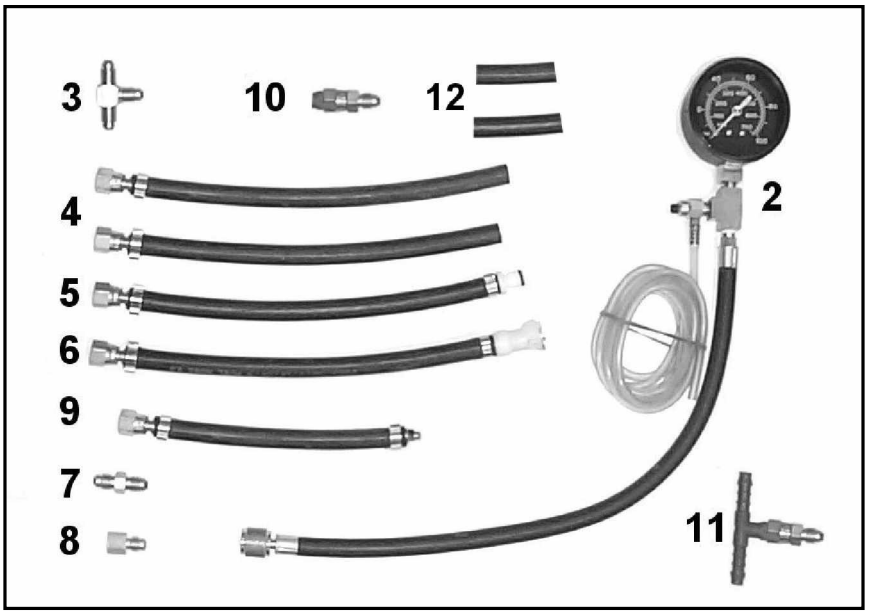
Motorcycle Fuel Pressure Test Kit

Operating Instructions



*** Caution – read whole manual before using this product ***

Parts List			
item	***qty***	***description***	***notes***
1	1	Parts list (this sheet) & instructions	
2	1	Fuel pressure gauge c/w hose, valve & drain	
3	1	7/16” male T-piece	Use with #4 / 5 / 6
4	2	Hose: 7/16” female to ¼” hose	Use with #3 T-piece
5	1	Hose: 7/16” female to male QR coupling	Use with #3 T-piece
6	1	Hose: 7/16” female to female QR coupling	Use with #3 T-piece
7	1	7/16” male straight connector	
8	1	Schrader connector	
9	1	7/16” male to 6mm male	
10	1	7/16” male to 10mm male fitting	Oil pressure testing
11	1	7/16” male to 6mm / 8mm hose T-piece	
12	2	Short hose – 1 x 6mm; 1 x 8mm	Use with #11
13	2	Hose clips	Use with #4 / #12
14	1	Carry case	

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Fuel Pressure Testing – adaptor application list

Fuel Pressure Tester Adaptors			
Make & model		**Adaptor required**	**Use**
Aprilia	RSV1000	T-piece + QR couplings in fuel line	5,6 and 3
Bimota	SB8	6mm	9
		T-piece + QR couplings in fuel line	5,6 and 3
BMW		T-piece in fuel line	3,4
Cagiva	Raptor, V Raptor	6mm	9
Ducati:	748; 916; 966 etc.	T-piece + QR couplings in fuel line	3,5,6
	750; 900; 907ie etc.	T-piece in fuel line	3,4
Honda	Blackbird, X11, VFR800i; CBRs etc.	6mm	9
	SP1 etc		
Kawasaki	VN1500; etc.	T-piece in fuel line	3,4
Laverda	650, 668, 750	T-piece in fuel line	3,4
Moto Guzzi	Cali 1100i; Daytona, V10; V11 etc.	T-piece in fuel line	3,4
MV	F4	T-piece in fuel line	3,4
Suzuki	Hayabusa; GSXRs; TL1000 etc.	6mm adaptor	9
Triumph	T595; 955i etc	T-piece + QR couplings in fuel line	3,5,6
Yamaha			

NB - Blank spaces are included for your own records – please advise us of any new adaptor requirements as you discover them – we will be happy to manufacture them for you if we know what is required.

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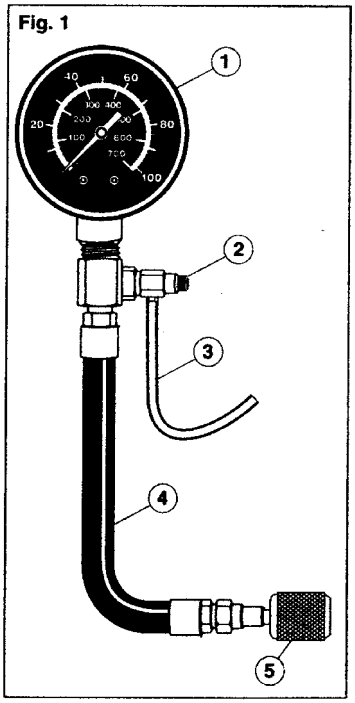
Fuel Pressure Tester Kit – Instructions

Fuel Pressure Tester – Description



1) **Dial Face:** Measurement scale that shows amount of fuel pressure present in fuel system.

2) **Pressure Relief Button:** Used to relieve fuel pressure in the gauge hose before disconnecting the gauge hose from the fuel rail.

3) **Bleed-Off Hose:** A 6-ft. hose that bleeds off fuel pressure when the pressure relief button is pressed. It is acceptable to shorten this hose to a more convenient length.

   Important: *Always make sure end of bleed-off hose is in an approved container for fuel at all times during testing and when bleeding off fuel pressure!!*

4) **Gauge Hose:** Hose that carries fuel to the gauge so that pressure can be measured.

5) **Adaptor fitting:** connection for various adaptors.

Fuel Injection System - Theory

There are two basic types of fuel injection systems currently being used. The first type is called "direct" or "multi-port" fuel injection. In this system, the fuel injectors spray fuel directly into the intake manifold behind the intake valve. These systems typically have one fuel injector per cylinder. The second type is commonly called Throttle Body Injection (TBI) or Central Fuel Injection (CFI). These systems use one or two fuel injectors mounted on top of the intake manifold. They spray fuel into the throttle body similarly to a conventional carburettor.

Fuel Injection System Components

Before doing any fuel pressure testing, it is a good idea to understand how fuel system components work and how they relate to one another. The fuel pump pumps fuel from the fuel tank to the fuel pressure regulator and fuel injectors. The fuel pressure regulator divides fuel between the pressure line and the return line. The fuel in the pressure line goes to the fuel injectors, while the fuel in the return line is returned to the fuel tank.
Fuel Pump Filter: A filter that is usually located in the fuel tank. Its function is to prevent foreign particles from reaching the fuel pump. A clogged or restricted fuel pump filter can cause low fuel pressure readings. When replacing a fuel pump it is a good idea to clean or replace the fuel pump filter.
Fuel Pump: An electric motor that pumps fuel into the fuel system at a constant pressure. It is mounted in the fuel tank or on the frame. Some vehicles have more than one fuel pump.
Return Line: Path way for excess fuel to return to the fuel tank.
Pressure Line: A pressurised fuel line that carries fuel from the fuel tank to the fuel injectors.
Fuel Filter: An in-line filter that is located in the pressure line. Its function is to prevent foreign particles from reaching the fuel injectors. A clogged or restricted fuel filter can also cause low fuel pressure readings. This is the only fuel system component that requires periodic replacement. Refer to vehicle manual for replacement interval.
Fuel Pressure Test Port: A 6mm (as on some Suzuki & Honda M/Cs) or Schrader (as on cars) valve located on the fuel rail that allows easy connection of a fuel pressure gauge to measure fuel pressure. Where no test port is fitted, it is necessary to tee into the fuel pressure line using the adaptors supplied – use chart for reference
Fuel Pressure Regulator: The fuel pressure regulator is connected across the pressure line and return line. It contains a spring-loaded valve assembly that opens to allow fuel to move into the return line, when the pressure line fuel pressure is exceeded. It is used to keep a constant fuel pressure drop across the fuel injectors. Some fuel pressure regulators have a vacuum port so fuel pressure can be adjusted based on engine load. These are commonly called vacuum actuated (compensated) fuel pressure regulators. A leaking fuel pressure regulator can cause low fuel pressure readings and hard starting problems.
Fuel Rail: The fuel rail assembly is bolted to the intake manifold. Its purpose is to deliver pressurised fuel to the fuel injectors and, in some cases, to hold the fuel injectors in place.
Fuel Injectors: A precision valve that is controlled by a solenoid. Fuel injection is controlled by the amount of fuel pressure, and the size and duration of the valve opening. Fuel injectors contain a filter used to prevent very small particles from clogging the valve. Leaking fuel injectors will cause fuel pressure to slowly decrease when the ignition key is on and engine is off.

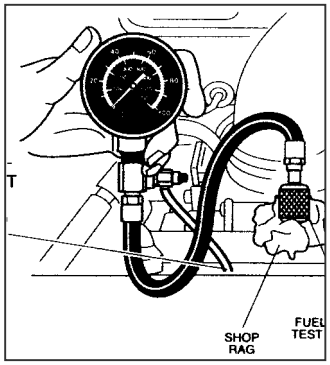
Pre-Testing Checks

1) Read Safety Precautions.
2) Do a thorough visual and "hands-on" inspection of the engine and fuel system. Look for loose or cracked electrical wiring, battery cables, ignition wires, and fuel or vacuum lines.
3) Verify that the battery is fully charged and fuel tank has an adequate supply of fuel.
4) Verify that all fuel system fuses are good.
5) Verify fuel vapour recovery system and filler cap are in good condition.
6) Verify that inlet vacuum is within manufacturers' specification at idle.
7) Look for fuel leaks and wipe up any spilled fuel immediately.
8) If engine will not start, check ignition system for spark. If no ignition spark is present, refer to vehicle manual.

Fuel Pressure Testing Procedures

This test procedure explains how to make fuel pressure measurements on vehicles while the ignition key is on and while the engine is at idle. The procedure also explains the safest way to connect and disconnect the fuel pressure tester kit from vehicles equipped with test ports. If the fuel pressure readings measured in this test procedure are not within your vehicles manufacturing specification, then you must use your vehicle service manual along with the fuel pressure tester kit to service the problem. This test procedure does not contain any vehicle specific diagnostics.

1) Read all SAFETY PRECAUTIONS and PRE-TESTING CHECKS.
2) Ensure all connections between port adapters are tight and sealed.
3) Turn Ignition Key OFF.
4) Locate fuel rail test port (if present) and remove any protective cap.
5) Note: Always wrap a shop rag around fuel rail test port when attaching test port adapters. This is a precaution in case a small amount of fuel leaks out while attaching adapters.
6) Attach any adaptors as per vehicle manufacturer's instructions.
7) Place end of 6 ft. bleed-off hose in an approved container for fuel. Bleed-off hose must remain in container until testing is complete.
8) Turn all accessories OFF.
9) Turn ignition key ON.



Do the following checks...

- Listen for fuel pump. Pump should run for approximately 2 seconds.
- Check fuel system for leaks. If leaks are found, turn ignition key OFF and wipe up fuel immediately!
- Read fuel pressure from dial face. Pressure should rise to manufacturer's specification and hold steady even after fuel pump stops running. Refer to vehicle service manual for fuel pressure specifications.
- If fuel pressure is not within manufacturer's specification, than service vehicle according to service manual.
- When repair is completed and key-on-engine-off fuel pressure is now within manufacturers specification, proceed to Step 8.
- For instructions on how to safely disconnect the Pressure Tester from the fuel rail test port, proceed to Step 9.

10) Start engine - Let idle.

- If your vehicles fuel system uses a vacuum actuated (compensated) fuel pressure regulator then fuel pressure should drop approximately 3-10 psi, depending on manifold vacuum.
- If your vehicles fuel system uses a fuel pressure regulator without a vacuum port than fuel pressure should remain constant during both key-on-engine-off and idle.
- Read fuel pressure from dial face.
- If fuel pressure is not within manufacturer's specification, than service vehicle according to service manual.
- When repair is completed & idle fuel pressure is now within manufacturers specification, proceed to Step 9.
- To safely disconnect the Fuel Pressure Tester Kit from the fuel rail test port and perform repairs at a later time, proceed to Step 9.

11) Turn Ignition Key OFF.
12) Verify that 6 ft. bleed-off hose is still in an approved container for fuel.
13) Fully DEPRESS and HOLD the pressure relief button until dial face pointer is resting on stop pin.
14) Shake bleed-off hose to make sure that all fuel went into approved container.
15) Remove gauge hose from fuel test port or adaptor.
16) Store shop rags in an approved container so they cannot cause personal injury or a hazardous situation.
17) Store Fuel Pressure Tester in a well ventilated area where it cannot cause personal injury or a hazardous situation.

General Fuel Pressure Diagnostics

Fuel pressure checking is an essential part of fuel injection system troubleshooting. High fuel pressure can make an engine run rich, while low fuel pressure can make an engine run lean or not at all. Fuel pressure readings that are higher than manufacturers' specifications are generally caused by a problem in the return line fuel components. Conversely, fuel pressure readings that are lower than manufacturers specifications are generally caused by a problem in the pressure line fuel components. If fuel pressure readings are not within manufacturers specifications, then refer to a vehicle service manual for step-by-step diagnostic procedures that will pinpoint the faulty component for your specific vehicle.

Possible causes of high fuel pressure readings are the following:

- Faulty fuel pressure regulator.
- Restriction in return line.
- Faulty fuel line couplings at fuel tank.

Possible causes of low fuel pressure readings are the following:

- Clogged or restricted fuel filter.
- Restriction in pressure line.
- Faulty fuel pump.
- Faulty fuel pump relay.
- Bad fuel pump fuse.
- Faulty fuel pump wiring.
- Clogged or restricted fuel pump filter.
- Faulty fuel pressure regulator.
- Leaking fuel injectors.
- Faulty fuel line couplings at fuel tank.

Safety Precautions

To prevent accidents that could result in serious injury and/or damage to your vehicle or test equipment, carefully follow these safety rules and test procedures at ail times when working on vehicles.

- *Always wear approved eye protection and other appropriate fuel-resistant personal protective clothing e.g. gloves etc.*
- *Always double-check pressure-tightness of Fuel System & Pressure Tester connections before turning the ignition on.*
- *Never attach or remove Fuel Pressure Tester Kit from fuel rail test port with the ignition on.*
- *Always ensure that Fuel Pressure Tester adaptors are securely fitted and pressure tight.*
- *Always use a hose clip when using adaptor hoses or T-pieces to safely connect Fuel Pressure Tester Kit.*
- *Always place end of bleed-off hose in an approved fuel container during testing and when bleeding off fuel pressure.*
- *Never smoke or have open flames near vehicle. Vapours from fuel systems are highly flammable and explosive.*
- *Never permit fuel to spill on hot engine parts. If a spill or leak occurs, immediately turn ignition key off, and clean up fuel.*
- *Only use the Fuel Pressure Tester Kit for measuring fuel pressure with approved adaptors. Always operate the vehicle in a well ventilated area. Do not inhale exhaust gases or fuel vapours - they are very hazardous!*
- *Always keep yourself, tools and test equipment away from all moving or hot engine parts.*
- *Never lay tools on vehicle battery. You may short the terminals together causing harm to yourself, the tools or the battery.*
- *Never leave vehicle unattended while running tests.*
- *Always keep a fire extinguisher suitable for fuel/electrical/chemical fires handy.*
- *Always use extreme caution when working around the ignition coil, distributor cap, ignition wires, and spark plugs. These components contain High Voltage when the engine is running.*
- *Complete all Pre-Testing Checks before beginning fuel pressure testing.*
- *Always follow vehicle manufacturer's warnings, cautions and service procedures.*